

TagPro 1.1 USER'S MANUAL

CONVERTING ACOUSTIC-TAG EVENTS INTO CAPTURE HISTORIES

COLUMBIA BASIN RESEARCH SCHOOL OF AQUATIC AND FISHERY SCIENCES





W UNIVERSITY of WASHINGTON

TagPro

Acoustic-Tag Data Translation Utility Version 1.1

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Chapter 1: Overview

TagPro is a desktop application that takes acoustic-tag event data and creates an output file of capture/detection histories used for survival analysis by Program ATLAS or other software.

Below is an image of the TagPro user interface at startup (Figure 1).

Data Settings Help Gear icon for executing runs ta Releases Sites Files User-selectable tabs input Data Folder Load Dutput Output Folder Defined Runs Name Format Releases Sites TagPro TagPro Trializing Connecting to database. Ready. Clearing data done.					-		
Gear icon for executing runs	Data Setti	ings Help					
ta Releases Sites Files User-selectable tabs	} +	Gear icon for	executing runs	5			
input Data Folder, Load Dutput Dutput Dutput Folder Defined Runs Name Format Releases Sites Add Run Edit Run Delete Run Status TagPro TriagPro Tria	ata Release	s Sites Files		User-selectal	ble tabs		
Data Folder Load Dutput Output Folder Defined Runs Name Format Releases Sites Add Run Edit Run Delete Run Status TagPro Initializing Connecting to database. Ready. Clearing data done.	Input						
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Dutput Folder						LUGU	_
Output Folder	Dutput						
Defined Runs Name Format Releases Sites Add Run Edit Run Delete Run Status TagPro Initializing Connecting to database. Ready. Clearing data done.	Output Folder						
Name Format Releases Sites Name Format Releases Sites Add Run Edit Run Delete Run Status TagPro Initializing Connecting to database. Ready. Clearing data does	Defined Runs						
Add Run Edit Run Delete Run Status TagPro Initializing Connecting to database. Ready. Clearing data done.	Name	Format	Releases	Siter			
Add Run Edit Run Delete Run Status TagPro Initializing Connecting to database. Ready. Clearing data done.	Nume	1 onnac	Neleases	Sites			
Add Run Edit Run Delete Run Status TagPro Initializing Connecting to database. Ready. Clearing data done.							
Add Run Edit Run Delete Run Status TagPro Initializing Connecting to database. Ready. Clearing data done.							
Add Run Edit Run Delete Run Status TagPro Initializing Connecting to database. Ready. Clearing data done.							
Status TagPro Initializing Connecting to database. Ready. Clearing data done.							
TagPro Initializing Connecting to database. Ready. Clearing data done.				Add Run	Edit Run [Delete Rur	n
Initializing Connecting to database. Ready. Clearing data done.	Status			Add Run	Edit Run	Delete Rur	1
Initializing Connecting to database. Ready. Clearing data done.	Status TadPro			Add Run	Edit Run [Delete Rur	1
Ready. Clearing data done.	Status TagPro			Add Run	Edit Run [Delete Rur	1
done.	Status TagPro Initializing Connecting to	database.		Add Run	Edit Run	Delete Rur	1
	Status TagPro Initializing Connecting to Ready.	database.		Add Run	Edit Run	Delete Rur	1
	Status TagPro Initializing Connecting to Ready. Clearing data done.	database. 		Add Run	Edit Run	Delete Rur	1

Figure 1. The main TagPro user interface window at startup

There are four main tabs—"Data," "Release," "Sites," and "Files" —where the primary work is done. The user presses the gear icon in the upper left to execute user-defined runs. At startup before any data are loaded, only the Data tab is available.

There is also a main menu bar above the gear icon across the top. The only functionality in that menu not available elsewhere is the "Clear All" command under "Data." This function clears all input data, and the TagPro application will revert to its initial startup configuration. Because this command is potentially destructive, if the user selects it, a warning appears that allows the user to cancel that choice.

The user must take the following steps in TagPro to create an output file:

- 1. Load the input data
- Define the release groups
 Define the sites
- 4. Define the runs
- 5. Execute the runs

The following chapters of this manual cover each of these steps.

Chapter 2: Load the Input Data

In order to begin loading input data into TagPro, the user must first specify the data folder where the input data files are stored. Three files are required for TagPro: (1) tag release information, (2) detection node and array site information, and (3) validated detection event information. Format and required data for each are documented in Appendix A. These files must use the file names listed here:

- tags.csv
- nodes.csv
- events.csv

A "removals.csv" file detailing censoring events may also be used.

The user also specifies the output folder location. Once these folders have been selected, TagPro will remember the locations on subsequent runs. The user can then load the data using the "Load" button (circled in Figure 2). TagPro displays the status of the load process in the status window.

Input	ases Sites	Files				
Data Folder Output		Clic	k here to se	lect data folder	Load	\supset
Output Folde	er					
Defined Runs			Click here to	o select output fo	older	
Name	Form	nat	Keleases	Sites		
				Add Run E	dit Run Delete F	Run
Status						
TacDro						

Figure 2. Loading input data and selecting an output folder in TagPro via the "Data" tab

A pop-up window will appear once data have been successfully loaded (Figure 3).

Data Settings	нер					
3						
ata Releases	Sites Files					
Input						
Data Folder Dr/TagR	ro Data				Load	
Data Folder D./Tagr	io Data				Luau	
Output						
Output Folder D:/Ta	gPro Data/Output			_		
Defeed Dure			TagPro	×		
		_	Dat	a Loaded.		_
Name	Format	Releases				
				OK		
L			Add Run	Edit Run	Delete Ru	
				Latertain	beleterta	
Status						
Loaded 1003 rows. Loading D:/TagPro D	ata/nodes.csv					
Loaded 33 rows.						
Loaded 14489 rows.	ata/events.csv					1
Loading D:/TagPro D	ata/removals.csv					
Loaded 5 rows.						1

Figure 3: The confirmation popup in TagPro after data have been loaded

Unsuccessful loads may occur if the required files are missing, incorrectly named, lacking required columns within the files, or if the data are incorrectly formatted. The most common of these issues is the data format for date-time, as Excel is often used to view or edit these files and defaults date-time objects to an incorrect format. The next section describes common fixes for this issue.

Date and Time Format

TagPro accepts two types of date and time format in the input files and provisionally a third format:

- 1. yyyy-mm-dd hh:mm:ss: (e.g., 2021-03-15 03:00:15; the default format, and the format required by previous versions of TagPro)
- 2. mm/dd/yyyy h:mm:ss: (e.g., 3/15/2021 3:00:15)

If an input .csv file is edited and saved in Excel, the date and time fields will be saved by default with the format mm/dd/yyyy h:mm (e.g., 3/15/2021 3:00). This is the same as the second

format above without the seconds. If the user loads a data file with date and time in this format, an error displays in the status window (Figure 4). TagPro is warning the user that the lack of seconds on the date and time records can negatively impact the precision of estimates. The third provisional format can be set if the user chooses to accept this condition and then checks the "Allow times without seconds" option in the Settings menu (Figure 5). If the user turns this option on, a warning dialog again appears, warning the user of a loss of precision. If the user accepts this warning, the input files can then be loaded with the date and time records in the default Excel format.

When TagPro is terminated and subsequently restarted, it will revert to not allowing times without seconds.

Status	
56665	
Loading D:/TagPro Data/tags.csv	
Loaded 1003 rows.	
Loading D:/TagPro Data/nodes.csv	
Loaded 33 rows.	
Loading D:/TagPro Data/events.csv	
Seconds missing in "events" line 2 - "5/16/2021 21:35" which will affect precision. If this is acceptable,	1.1
go to Settings to allow times with no seconds and reload data.	
Load data process canceled.	

Figure 4: The warning generated when an input file lacks seconds in a date and time record

TagPro				_		\times
ile Data	Settings Help					
(i)	Allow times w	ithout seconds				
Data F	eleases Sites	Files				
Input						
Data Fol	der D:/TagPro Data				Load	
Output						
Output F	older D:/TagPro Data	/Output				
Defined I	luns					
Name	Format	Releases	Sites			1

Figure 5: The "Allow times without seconds" option in the "Settings" menu

Chapter 3: Define the Release Groups

After loading the data, the user can select the "Releases" tab to define the releases (Figure 6). The top section, labeled "Available Release Groups," shows all releases from the tags input file as defined by release location, species, and tag year. The bottom section shows the releases defined by the user. The user can define releases in one of two ways:

- 1. Select one or more of the available releases and press the "Bulk Add" button to add themto the "Releases" window in the bottom section.
- 2. Select one or more of the available releases to combine into one release. In this case theuser can accept the default name (the release names are hyphenated) or edit the releasename in the "Release Name" box and press "Create."

Relea Av	ase Builder ailable Release Groups				
Γ	Release Location	Release River KM	Species	Tag Year	Release Count
1	Rocky Reach Tailrace	762	11H	2021	493
2	Rocky Reach Tailrace	762	11W	2021	76
3	Rock Island Tailrace	729	11H	2021	361
4	Rock Island Tailrace	729	11W	2021	73
Relea	ases				
Rel	ease Site River Ki	M			

Figure 6. The TagPro "Releases" tab

Selecting "Bulk Add" allows the user to create a large number of release groups where each line represents an individual release. Selected groups are highlighted in blue (Figure 7). Added releases appear in the lower "Releases" window (Figure 8) and are available for further processing in TagPro.

ata Rele	Da	ta Settings H Releases Sit se Builder illable Release Grou	Help tes F	iles				
		Release Locatio	n	Release River KN	Species	Tag Year	Release Count	
	1	Rocky Reach Tail	lrace	762	11H	2021	493	
	2	Rocky Reach Tail	lrace	762	11W	2021	76	
	3	Rock Island Tailra	ace	729	11H	2021	361	
	4	Rock Island Tailra	ace	729	11W	2021	73	
Rele	ea	Release Name: ce ses	e-Rocky I	Reach Tailrace Rive	er Kilometer: 762		Create Bu	k Add
Re	ele	ase Site Ri	iver KM					

а	Releases Sites Fi	les			
ele	ase Builder				
A۱	vailable Release Groups	Release River KM	Species	Tag Year	Release Count
1	Rocky Reach Tailrace	762	11H	2021	493
2	2 Rocky Reach Tailrace	762	11W	2021	76
з	8 Rock Island Tailrace	729	11H	2021	361
4	4 Rock Island Tailrace	729	11W	2021	73
	Release Name: ce-Rocky R	each Tailrace River	Kilometer: 762		Create Bulk Add
ele	ases				
T	Release Site	River KM			
	Rocky Reach Tailrace 11H	762			
	Deales Deale Tailes as 1114	762			

Figure 8. Releases added using "Bulk Add"

Alternatively, the user can combine releases into larger groups. In this example, rather than treating the wild and hatchery tagged groups as individual releases, two releases can be pooled into one by selecting them both in the "Available Release Groups section". The default group name can be simplified. Below we changed the combined group to "RI Tailrace all species" (circled, Figure 9), and then pressed the "Create" button, with the result shown in Figure 10.

Tag	gPro				-	
	Data Settings Help					
\$						
ta	Releases Sites Fi	les				
lel	ease Builder					
A	vailable Release Groups					
ſ	Release Location	Release River KM	Species	Tag Year	Release Co	unt
	1 Rocky Reach Tailrace	762	11H	2021	493	
	2 Rocky Reach Tailrace	762	11W	2021	76	
	3 Rock Island Tailrace	729	11H	2021	361	
	4 Rock Island Tailrace	729	11W	2021	73	
	Deless New DITeless	all and shad	Kilomotow 700		Custa	Dulli Andal
	Release Name: RI Tailrace	all species	Kilometer: 729			BUIK Add
tel	eases					
	Release Site	River KM				
1	Rocky Reach Tailrace 11H	762				
2	Rocky Reach Tailrace 11W	762				

Figure 9. Create a release using the "Create" button

3	pero Data Settings Help				- 0
ata	Releases Sites Fi	les			
Rel A	ease Builder vailable Release Groups				
ſ	Release Location	Release River KM	Species	Tag Year	Release Count
	1 Rocky Reach Tailrace	762	11H	2021	493
	2 Rocky Reach Tailrace	762	11W	2021	76
	3 Rock Island Tailrace	729	11H	2021	361
	4 Rock Island Tailrace	729	11W	2021	73
Rel	Release Name: RI Tailrace	all species River	Kilometer: 729		Create Bulk Add
	Release Site	River KM			
1	Rocky Reach Tailrace 11H	762			
2	Rocky Reach Tailrace 11W	762			
3	RI Tailrace all species	729			

Figure 10. New releases created by combining two releases

Chapter 4: Define the Sites

The user selects the "Sites" tab to define detection sites. The top section, "Available Arrays," shows the locations available as defined in the nodes input file (Figure 11). The user then defines sites in the same way that releases are defined as described in the previous section, in that each line can be created as an individual site using "Bulk Add" or pooled by highlighting multiple sites and using "Create."

Sites Av	Builder ailable Arrays						
	Location	River KM	Deploy Year	Node Count			
1	RIBZ	730.5	2021	5			-
2	RIFB	729.8	2021	10			_
3	RIDF	729.6	2021	7			
4	CBAR	713.7	2021	5			
5	SLND	698.5	2021	6			
	Site Name:		River Kilometer:		Create	Bulk Add	d
Sites							
Loc	ation	River KM					

Figure 11. The "Sites" tab for setting sites

TagPro \times _ File Data Settings Help 03 Data Releases Sites Files Sites Builder Available Arrays Location **River KM** Deploy Year Node Count 1 RIBZ 730.5 2021 5 2 RIFB 729.8 2021 10 3 RIDF 729.6 2021 7 4 CBAR 5 713.7 2021 5 SLND 698.5 2021 6 Site Name: Final River Kilometer: 698.5 Create Bulk Add Sites Location River KM 1 RIBZ 730.5 729.8 2 RIFB 3 RIDF 729.6 4 Final 698.5 Delete

In the below example (Figure 12), the user selected the first three arrays (RIBZ, RIFB, and RIDF), pressed "Bulk Add," then selected the final two arrays (CBAR and SLND), renamed the site "Final," and pressed "Create."

Figure 12. The "Sites" tab with user-defined sites

Chapter 5: Define the Runs

Once the user has defined the releases and sites, they can define the output runs of detection histories. Runs are defined by:

- 1. the desired output format ("ATLAS" or "Standard")
- 2. the selected release(s)
- 3. the selected sites

To define a run, the user must go back to the Data tab (Figure 2) and press the "Add button, bringing up the "Add Run Definition" dialog (Figure 13). The user gives the run definition a name ("TagPro example" in this case) and selects an output format ("ATLAS "or "Standard"). In the case below, the user has selected ATLAS. The user then presses "Next." Refer to Appendix B for a description of the two types of output files.

Add Run Definition	? ×
Run Info Select a name and format for the run.	
Run Info Name TagPro example	
Output Format: ATLAS V	
< Back	Next > Cancel

Figure 13: The "Add Run Definition" dialog for naming and selecting output format

The Next button brings up the "Release Group Selection" dialog (Figure 14). Here the user selects one or more release groups. In this example the user has selected "RI Tailrace all species." The user then presses Next for the "Sites Definition" dialog (Figure 15). In the Figure 15 example, the user has selected all sites.

T Ad	d Run Definition		?	×
Rele	ease Group Selection Select one or more release gro first release group together at	ups. The release groups apear in the output with the the start of the output, followed by the fish from th	e fish for ti e second,	he etc.
Sel	ect Releases			
	Release Site	River KM		
1	Rocky Reach Tailrace 11H	762		
2	Rocky Reach Tailrace 11W	762		
3	RI Tailrace all species	729		
		< Back Next >	Cance	el

Figure 14: The "Release Group Selection" dialog for selecting releases

	Location	River KM
1	RIBZ	730.5
2	RIFB	729.8
3	RIDF	729.6
4	Final	698.5

Figure 15: The "Sites Definition" dialog for selecting detection sites for run definition

After pressing the Next button, the run definition summary appears (Figure 16). At this point the user can either press "Back" to modify the run definition, or "Finish" to complete the run definition.

T Add Run D	efinition		?	×
Review Confirm t When yo	hat your selections are corr u are satisfied click Finish.	ect. Use the back button to go	back and make changes.	
Run Definitio	on Summary			
Run Sun	mary			
Name: Format: Releases	TagPro example ATLAS :: RI Tailrace all species			
Sites:	RIBZ,RIFB,RIDF,Final			
				-
		< Back	Finish Cance	4

Figure 16: The "Run Summary" definitions including Name, Format, Releases, and Sites

The run is then displayed as shown below (Figure 17).

ata Inp	Releases S	ites Files			
Da	ta Folder D:/TagPro	Data			Load
Out	tput				
Ou	tput Folder D:/Tag	Pro Data/Output	:		
Def	fined Runs				
	Name	Format	Releases	Sites	
	rvanic				

Figure 17: The "Data" tab with one run defined

Chapter 6: Execute the Runs

Once runs have been defined, the final step is to select the desired runs (individually or multiple—each run will be saved individually). In our example, the user has defined two runs and selected both (Figure 18). The user presses the gear icon to process the selected runs. Alternatively, select "Run" under the "File" menu. When the runs are processed successfully, the number of records written to the output files is recorded in the Status area and a "Run Complete" message appears (Figure 19).

ata	Releases Si	tes Files				
inpi	ut					
Dat	ta Folder D:/TagPro	Data			Load	
Out Def	tput Folder D:/TagP	Pro Data/Output				
Out Def	tput Folder D:/TagF ined Runs Name	Pro Data/Output	Releases	Sites		
Out Def	tput Folder D:/TagF ined Runs Name TagPro example	Format ATLAS	Releases RI Tailrace all species	Sites RIBZ, RIFB, RIDF, Final		

Figure 18: Two runs selected and ready to be processed

TagPro					_		\times
Ie Data Settings F	lelp						
\$							
Data Releases Sit	tes Files						
Input							
Data Folder D:/TagPro	Data					Load	
Output							
Output Folder D:/TagP	ro Data/Output					(
Defined Runs							
		-					
Name	Format	Tagi	pro X	ites			
1 lagPro example	AILAS		Run complete.	IBZ, KIFB, KIDF, Fina	31		
2 Second example	Standard	R		IBZ,RIFB,RIDF,Fina	al		
			ОК				
		_					
				Add Run E	dit Run D	Delete Run	
Status							
TagPro							
Initializing							
Connecting to database Ready.	е.						
Processing run TagPro	example						
Processing run Second	example						
Complete.							
							_

Figure 19: TagPro after processing the runs

The resulting output files are placed in the specified output folder. The output file names are defined by the name of the run followed by the format of the run (Figure 20).

Name	Date modified	Туре	Size
Second example_Standard.csv	4/5/2023 1:29 PM	Microsoft Excel C	196 KB
TagPro example_ATLAS.csv	4/5/2023 1:29 PM	Microsoft Excel C	153 KB

Figure 20: Example of TagPro output files

Appendices

Appendix A: Input file Formats

The following shows the names of the required fields in each input file. The input files are comma separated value (.csv) files. The following required field names must be in the header of each file, but they can be in any order. Other fields are allowed to be present but they will be ignored by TagPro.

For the tags.csv file, the italicized field names are output as part of the "Standard" format, but not the "ATLAS" format. They are optional, and if present, empty values are allowed.

The field names are followed by their data type:

tags.csv

- tagger_name: text
- *bucket: integer*
- *length: integer*
- weight: real
- tag code: text
- lot: integer
- species_code: text
- tag_date: datetime
- activation date: datetime
- release date: datetime
- release location: text
- release river km: real
- mortality: integer (1 for mortality, 0 for not mortality)

nodes.csv

- node code: text
- deploy_date: datetime
- location: text
- river km: real

events.csv

- node_code: text
- tag_code: text
- first_datetime: datetime
- last datetime: datetime

removals.csv

- tag_code: text
- removal_date: datetime
- removal_river_km: real

Appendix B: TagPro Output Files

TagPro can produce two types of output files.

- 1. The ATLAS format produces the required input format for Program ATLAS. It contains a fixed number of columns:
 - release name
 - lot
 - tag code
 - tag activation date and time
 - tag release date and time
 - site
 - 1 for detected, 0 for not detected
 - last detection date and time (if detected)
- 2. The **Standard** format has one row for each tag and, unlike the ATLAS format, has a variable number of columns depending on the number of detection sites. The columns for tagger name, bucket, etc., can be used to easily create optional attribute files for Program ATLAS. The first columns are:
 - release name
 - lot
 - tag code
 - tag activation date and time
 - tag release date and time
 - tagger name
 - bucket
 - length
 - weight
 - one field for each detection site with a "1" for detected, "0" for not detected
 - two fields for detection site: the first detection date and time, and the last detection date and time

Appendix C: Customizing the Date and Time Format in Excel

The following describes how to save a .csv file in Excel and preserve the seconds in date and time fields.

Figure C1 shows a tags file in an Excel worksheet with the three date-time fields selected (tag_date, activation_date, and release_date). The user has right-clicked on the selected fields and is selecting "Format Cells..." from the context menu.

	A	В	C	D	E	F	G	H	I I	(o. iii. :		^ •× ¢					
1	tag_code	tagger_name	bucket	lot	species_code	length	weight	pit_code	tag_date	Calibri		A \$	* %	7 🔛	se_lo	cation	rele
2	G72051F83	Α	7	1	11H	161	41		4/22/20	ΒI	= 🗠 ~ 🔺	· - ·	€0 .00 .00 →0	Ś	/ Read	h Tailrace	Roc
3	G7205BF2C	Α	3	1	11H	149	33.5		4/22/202	21 0:00	4/21/2021 13:	38 4/23/2	2021 9:00	Roc	ky Read	h Tailrace	Roo
4	G720720ED	Α	3	1	11H	137	25		4/22/20	Searc	the menus		1:00	Roc	ky Read	h Tailrace	Roc
5	G720BF24B	Α	4	1	11H	140	27		4/22/20				1:00	Roc	ky Read	h Tailr ace	Roo
6	G7214AD25	Α	3	1	11W	125	21		4/22/20	χc	Cut		:00	Roc	ky Read	h Tailrace	Roc
7	G721633BA	Α	1	1	11H	146	30.5		4/22/20	[]a c	opy		1:00	Roc	ky Read	h Tailr ace	Roc
8	G72179E2C	Α	2	1	11H	156	38		4/22/20	-			1:00	Roc	ky Read	h Tailrace	Roc
9	G721A04CA	Α	5	1	11H	148	31		4/22/20		aste Options:		1:00	Roc	ky Read	h Tailr ace	Roc
10	G721E79F4	Α	9	1	11H	132	23		4/22/20	ľ	4		1:00	Roc	ky Read	h Tailrace	Roc
11	G7223BF47	Α	9	1	11H	135	25		4/22/20		-		1:00	Roc	ky Read	h Tailr ace	Roc
12	G722471FC	Α	8	1	11H	145	31		4/22/20	P	aste <u>S</u> pecial		:00	Roc	ky Read	h Tailrace	Roc
13	G7224B38A	A	2	1	11H	140	29.5		4/22/20	lr.	nsert		1:00	Roc	ky Read	h Tailrace	Roc
14	G7227A4C1	Α	5	1	11H	157	38.5		4/22/20	1	is circ		1:00	Roc	ky Read	h Tailr ace	Roc
15	G722EA3F0	A	9	1	11H	141	27.5		4/22/20	<u>D</u>	lelete		1:00	Roc	ky Read	h Tailrace	Roc
16	G723761D8	Α	10	1	11H	157	43		4/22/20	C	lear Contents		1:00	Roc	ky Read	h Tailr ace	Roc
17	G7237E154	A	6	1	11H	163	43		4/22/20				1:00	Roc	ky Read	h Tailrace	Roc
18	G72389EF5	Α	4	1	11H	148	31.5		4/22/20	E E	ormat Cells	3	1:00	Roc	ky Read	h Tailr ace	Roc
19	G723A02D6	Α	8	1	11W	148	32.5		4/22/20	c	olumn <u>W</u> idth		1:00	Roc	ky Read	h Tailrace	Roc
20	G723BE69A	Α	10	1	11H	155	40.5		4/22/20		Ed.		1:00	Roc	ky Read	h Tailr ace	Roc
21	G7244A213	Α	2	1	11H	155	35		4/22/20		line		:00	Roc	ky Read	h Tailrace	Roc
22	G7254310C	Α	2	1	11H	146	28.5		4/22/20	<u>U</u>	Inhide		1:00	Roc	ky Read	h Tailrace	Roc
23	G72551C16	Α	4	1	11H	152	35.5		4/22/202	21 0:00	4/21/2021 13:	18 4/23/2	2021 9:00	Roc	ky Read	h Tailr ace	Roo
24	G72559285	Α	11	1	11W	155	34.5		4/22/202	21 0:00	4/21/2021 13:	32 4/23/2	2021 9:00	Roc	ky Read	h Tailrace	Roo
25	G7258B64E	Α	8	1	11H	167	47		4/22/202	21 0:00	4/21/2021 13:	26 4/23/2	2021 9:00	Roc	ky Read	h Tailrace	Roc
26	G725A26CE	Α	7	1	11H	156	36.5		4/22/202	21 0:00	4/21/2021 13:	23 4/23/2	2021 9:00	Roc	ky Read	h Tailrace	Roo
27	G726942B2	Α	9	1	11H	148	29.5		4/22/202	21 0:00	4/21/2021 13:	48 4/23/2	2021 9:00	Roc	ky Read	h Tailrace	Roc
28	G726A4B7B	Α	8	1	11H	168	46.5		4/22/202	21 0:00	4/21/2021 13:	46 4/23/2	2021 9:00	Roc	ky Read	h Tailrace	
	G726BAE69	A	3	1	11H	138	27		4/22/202	21 0:00	4/21/2021 13:	37 4/23/2	2021 9:00	Roc	ky Read	h Tailrace	

Figure C1: Formatting date-time fields in a tags file in Excel

Figure C2 shows the resulting Format Cells dialog. The user selects "Custom" under Category, and under Type, enters "m/dd/yy h:mm:ss" and then presses OK.

Number Alignment Font Border Fill Protection Category:
Category: Sample Sample tag_date Currency tag_date Date Type: m/dd/yyyy h:mm:ss General Percentage General Fraction 0 Scientific 0 Text *##0.00 *##0.00 *##0.00 *##0.00_;[Red](#,##0) *##0.00_;[Red](#,##0.00) *##0.00_;[Red](#,##0.00) \$#,##0_0_;[S#,##0] \$#,##0_0_;[S#,##0] \$#,##0_0_;[S#,##0] \$#,##0_0_;[S#,##0] \$#,##0_0_;[S#,##0] \$#,##0_0_;[S#,##0]
<u>D</u> elete

Figure C2: Excel Format Cells dialog

Once this is done, when the user saves the .csv file, the seconds will be saved with the selected date-time fields.

